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2. The method of claim 1, wherein the charged polymer molecules used in said solution containing a mixture of charged polymer molecules and functional molecules and the charged polymer molecules used in said solution containing charged polymer molecules are different charged polymer molecules having opposite electric charges. 5

3. The method of claim 1, wherein the charged polymer molecules used in said solution containing a mixture of charged polymer molecules and functional molecules and the charged polymer molecules used in said solution containing charged polymer molecules are charged polymer molecules having the same electric charge. 10

4. A multiple layered functional thin film produced by the method of claim 1.

5. The multiple layered functional thin film of claim 4, wherein the functional molecules are proteins. 15

6. The multiple layered functional thin film of claim 5, wherein the protein is selected from the group consisting of glucose oxidase, peroxidase, glucoamylase, alcohol dehydrogenase, diaphorase, cytochrome, lysozyme, histone, myoglobin, and hemoglobin. 20

7. The multiple layered functional thin film of claim 4, wherein the functional molecules are pigments or dyes.

8. The multiple layered functional thin film of claim 7, wherein the pigment is selected from the group consisting of mordant yellow, mordant blue, flavin adenine dinucleotide, Congo Red, tetraphenylporphine-tetrasulfonic acid, Acid Red 27, Acid Red 26, Acid Red 52, Bismarck Brown, indigo carmine, and Ponceau. 25

9. The multiple layered functional thin film of claim 4, wherein as the charged polymer molecules are employed two different charged polymer molecules having opposite electrical charges. 30

10. The multiple layered functional thin film of claim 4, wherein the charged polymer molecules used in at least one of the solution containing charged polymer molecules and functional molecules and the solution containing charged polymer molecules are anionic polymer ions which include a functional group selected from the group consisting of sulfonates, sulfates, and carboxylates. 35

11. The multiple layered functional thin film of claim 4, wherein the charged polymer molecules used in at least one of the solution containing charged polymer molecules and functional molecules and the solution containing charged polymer molecules are cationic polymer ions having a functional group selected from the group consisting of quaternary ammonium ions and amines. 40

12. The multiple layered functional thin film of claim 4, wherein the charged polymer molecules are soluble in one of water and a water-organic solvent mixture. 45

13. A method for producing a multiple layered functional thin film which comprises:

immersing a solid support having an electric charge in a solution containing charged polymer molecules having a net electric charge opposite to that of the solid support to form a layer containing said charged polymer molecules; 50

immersing the solid support and said layer containing said charged polymer molecules in a solution containing a mixture of functional molecules that provide a desired function in a physical or chemical process and charged polymer molecules, different from the functional 55

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molecules, that form a matrix to fix the functional molecules, which solution of functional molecules and charged polymer molecules having a net electric charge opposite to that of the solution containing the charged polymer molecules; 60

repeating at least once said steps of immersing of said solid support in a solution containing charged polymer molecules and in a solution containing a mixture of charged polymer molecules and functional molecules to form a desired multi-layered thin film.

14. The method of claim 13, wherein the charged polymer molecules used in said solution containing a mixture of charged polymer molecules and functional molecules and the charged polymer molecules used in said solution containing charged polymer molecules are different charged polymer molecules having opposite electric charges.

15. The method of claim 13, wherein the charged polymer molecules used in said solution containing a mixture of charged polymer molecules and functional molecules and the charged polymer molecules used in said solution containing charged polymer molecules are charged polymer molecules having the same electric charge.

16. A multiple layered functional thin film produced by the method of claim 13.

17. The multiple layered functional thin film of claim 16, wherein the functional molecules are proteins.

18. The multiple layered functional thin film of claim 17, wherein the protein is selected from the group consisting of glucose oxidase, peroxidase, glucoamylase, alcohol dehydrogenase, diaphorase, cytochrome, lysozyme, histone, myoglobin, and hemoglobin.

19. The multiple layered functional thin film of claim 16, wherein the functional molecules are pigments or dyes.

20. The multiple layered functional thin film of claim 19, wherein the pigment is selected from the group consisting of mordant yellow, mordant blue, flavin adenine dinucleotide, Congo Red, tetraphenylporphine-tetrasulfonic acid, Acid Red 27, Acid Red 26, Acid Red 52, Bismarck Brown, indigo carmine, and Ponceau. 40

21. The multiple layered functional thin film of claim 16, wherein as the charged polymer molecules are employed two different charged polymer molecules having opposite electrical charges.

22. The multiple layered functional thin film of claim 16, wherein the charged polymer molecules used in at least one of the solution containing charged polymer molecules and functional molecules and the solution containing charged polymer molecules are anionic polymer ions which include a functional group selected from the group consisting of sulfonates, sulfates, and carboxylates. 45

23. The multiple layered functional thin film of claim 16, wherein the charged polymer molecules used in at least one of the solution containing charged polymer molecules and functional molecules and the solution containing charged polymer molecules are cationic polymer ions having a functional group selected from the group consisting of quaternary ammonium ions and amines.

24. The multiple layered functional thin film of claim 16, wherein the charged polymer molecules are soluble in one of water and a water-organic solvent mixture. 60